SECRET WORKING PAPER

25X1A
25X1A

This is the paper I was using to prepare a response to [redacted] request for evaluation of [redacted] proposal. As you are aware, the proposal is too general for full evaluation and [redacted] is scheduled to visit [redacted] for more information in a couple of weeks as you [redacted] called. 14 March 69

25X1A 25X1A

25X1A

MEMORANDUM FOR THE RECORD

25X1 SUBJECT: [redacted] Computer Display

25X1A

25X1A

25X1A

1. In response to a request from [redacted] Chief/ESD, [redacted] ESD/EL, was asked to comment on the [redacted] micro-densitometer display equipment.

25X1A

2. On 19 February 1969, [redacted] Chief/ESD, and [redacted] ESD/EL, attended a briefing in [redacted] office given by [redacted] The purpose of this briefing was to display the results of a high speed raster scan hard copy printer and discuss some of its properties. After the briefing, [redacted] asked [redacted] to comment in writing on what he had seen and heard. For his information, [redacted] was supplied a copy of an MFTR dated 11 February 1969, which expressed some of [redacted] feelings on the same subject when he got essentially the same briefing on 6 February 1969.

25X1A 25X1A 25X1A 25X1A 25X1A 25X1A 25X1A 25X1A 25X1A

3. The display device produced a raster scanned, ink-on-paper print and was billed as one component of total imaging system. The printer has a good grey scale range, a raster fine enough so as to be barely discernable when viewed at a distance of two feet or so, and a large print capability (approximately briefing-board size). Through multiple cycling full color or false color prints can be produced.

SECRET

4. The overall system into which this device interfaces contains a modified [redacted] scanning microdensitometer, an IBM 360/40 digital computer, and the aforementioned display unit. The full input/output cycle starts with raster-sampled density data from imagery on the microdensitometer. The sampling rate, sampling aperture, and scan length are independently adjustable, thus permitting speed, resolution, and matrix-size adjustment. This data is then fed into the computer where it is corrected for input scan imperfections, manipulated, formated, and printed out using the display device. The display device is controlled by the computer.

25X1A

5. The manipulation capabilities of the computer potentially run the gamut of what can be done to either enhance or restore the imagery. The typical enhancement techniques of density clipping, contrast building, or making non-linearity corrections can all be done using large data matrices as demonstrated on the 19th; however, to apply restoration techniques for defocus, image motion, atmospheric problems, or other system transfer function corrections, the use of Fourier Transform methods would be required. On the 360/40, this would limit the working matrix to a 128 X 128 array which would yield only twice the format size of the system at [redacted] for equivalent output raster frequencies.

25X1
25X1A

6. The prints displayed on the 19th demonstrated that [redacted] has built what must be the worlds most expensive enlarger. The grey scale manipulation which was done could be approximated through darkroom procedures and the grain suppression could be accompolished through careful defocusing of a conventional enlarging system. Techniques requiring the use of Fourier Transforms were not demonstrated, and indeed could not be for the format size displayed, unless 128 X 128 matrices were extracted from the data, operated on separately, and then used in mosaic form to

reconstruct a printout. This would be very time consuming at best.

7. If a non-silver photographic, computer controlled enlarger is what the center needs, then the [redacted] system should certainly be considered. 25X1A If on the other hand, an Image Restoration Facility is acquired, this system should also be considered; however, a final decision should be withheld pending the establishment of certain operating parameters for digital image restoration techniques. At the present time, for example, the extraction of information through the use of Fourier transform image restoration techniques has not been demonstrated for cases where the required information is in the 50-150 line/per millimeter frequency range. It is the opinion of this writer that the committment of funds of this magnitude (1.6 million) should not be considered until this capability can be demonstrated. This, by the way is the primary ~~unofficial~~ goal of the [redacted] D. I. R. program. 25X1A